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Extracted from THE OTTAWA NATURALIST, Vol. XIII, No. 9, December, 1899.

1. **Note on the occurrence of Bellinurus grandævus,** a new species of Palæozoic Limuloid Crustaceans recently described by Prof. T. R. Jones and Dr. Henry Woodward, from the Eo-Carboniferous rocks of Riversdale, Nova Scotia. By H. M. Ami, M.A., F.G.S.

2. **Report of the Geological Branch, Ottawa Field-Naturalists' Club, for 1898-1899.** By H. M. Ami, Leader in Geology & Palæontology.

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REPORT OF THE GEOLOGICAL BRANCH FOR 1898-1899.

To the Council of the Ottawa Field-Naturalists' Club:

In presenting this, the annual report of the work done by this branch of the Club, I have to report that whilst there may have been a considerable amount of individual and official as well as professional work done by many members of the Club in this district, there does not appear to have been a large amourt of concerted work in connection with the Club to report this season.

At the various excursions, or sub-excursions, held under the auspices of the Club during the past year, some one or more of your leaders appointed by your Council were present, and assisted in explaining the various geological formations and phenomena occurring in the several localities visited. The following comprise some of the excursions held and localities visited by the Club during the past year :

1. *Chelsea Hills*, north of Ottawa, in a district where rocks of Archæan age occur.

2. *Moore's Landing, Ont.*, at the head of Lake Deschenes, on the edge of the Ordovician system, and where the triple character of the sediments which constitute the Chazy formation may be seen and studied to advantage.

3. *Aylmer, Que.*, where the Chazy formation is also well developed, and has been studied with important results by our member, Mr. T. W. E. Sowter, whose interesting contribution to ethnological research in the Lake Deschenes district proved so attractive a feature of last winter's programme of soirées given under the auspices of the Club.

Sub-Excursions. Sub-excursions in geology were held at more or less regular intervals and led by leaders appointed last spring. This phase of our Club's work cannot be emphasized too strongly. Experience has proved that this method of carrying on local work is eminently productive of good results.

As an instance of work done at one of the sub-excursions held last summer, I beg to submit the following notes on an examination of the lower measures of the Utica formation in Gloucester. On the banks of the Rideau river and at the head of the old Rifle Range rapids, about half a mile above Cummings's Bridge, for a distance of several hundred feet along the east bank of the Rideau, some twenty-five feet of Lower Utica shales and limestones are exposed in the shape of a low depressed anticline, containing many interesting forms of fossil organic remains. A party of three visited this outcrop, and amongst the best specimens obtained may be mentioned the very prettily ornamented brachiopod, *Schizambon Canadensis*, better known for a number of years under the designation *Siphonotretu Scotica*, Davidson for the first time recorded by Mr. J. F. Whiteaves of the Geol Survey. Besides many of the species already recorded from this locality in a former paper by the writer, two new or undescribed forms of Ostracoda were found in the same bed: these, it is hoped, will shortly be described in the OTTAWA NATURALIST. *Zygospira Headi*, Billings, a form usually found in the Lorraine formation of eastern Canada, and also recorded from the Cincinnati group or highest Ordovician of Ohio and Kentucky, was also detected in the same bed of impure bituminous limestone containing *Schizambon*. As far as the writer is aware, this is the earliest record of the occurrence of this species at so low an horizon in the Ordovician. It is a rather short and rotund form with very fine, delicate longitudinal ribs, and may prove to be worthy of a new designation. It bears some resemblance and affinities to *Zygospira Anticostiensis*, Billings, from the limestones of a formation equivalent to the Lorraine as developed on Anticosti, in the Gulf of St. Lawrence.

Several interesting varieties of *Plectambonites sericea*, Sowerby, also occur at this horizon and were collected. From a preliminary examination of the forms obtained on this and previous occasions, four distinct types may be said to occur.

First, the small normal Trenton form, with its regularly rounded anterior margin and very delicate, evenly and alternately striated surface and non-ornamented shell.

Second, a larger, conspicuously mucronate variety which usually presents a rugose area immediately below the hinge-line on the dorsal valve, the rugae are outwardly directed, and form a conspicuous character in many individuals obtained.

Third, a small globose or exceedingly tumid variety with strongly arcuate valves and very minutely striated, with occasional distant radiating lines from the beak to the anterior margin numbering from four to six in different individuals. (This variety bears considerable resemblance to *Leptæna quinquecostata*, McCoy, from the Ordovician of Ireland.)

Fourth, the largest form usually classed under this designation, is one measuring nearly three centimetres in length and more than one centimetre in height, with the anterior margin subparallel for the greater part to the hinge margin, thus forming an irregular parallelogram. This form is not infrequently met with in the shales of the Lorraine formation in the vicinity of Quebec, Montreal and Toronto, as well as of Ottawa.

Besides the above notes on a few of the species obtained on this occasion further studies will no doubt reveal additional information of a most interesting nature to the student of local geology.

The locality is not only prolific in fossils but readily accessible. More than twenty species have already been recorded from this horizon—the zone of Schizambon—and amongst these may be mentioned the *Cirripede*, described by Dr. Henry Woodward as *Turrilepas Canadensis*, a number of opercular valves of which were also obtained by the writer since the shipment of the original specimens to Dr. Woodward from which the species was described.

The lower measures of the Utica formation, which consist at this particular locality as well as at New Edinburgh and Rochesterville of limestones and shales alternating with each other, rest perfectly conformably upon the uppermost measures of the Trenton formation. The writer desires to emphasize this statement in view of the oft-repeated assertion that throughout eastern Ontario and Quebec the Utica everywhere rests unconformably upon the Trenton formation. (See Trans. Roy. Soc. of Can., Vol. I, p. 258. 1883. Paper by T. Stery Hunt.)

Amongst the interesting collections made about Ottawa by local collectors during the past year may be mentioned one by Mr. W. H. Roger, of Billings's Bridge. Amongst the species recorded in the Roger collection from the Utica of Billings's Bridge there are two forms which prove to be hitherto unrecorded, whilst the remaining species, eminently characteristic of the Utica, are sufficiently numerous to enable one to state the precise horizon of the strata from which they were obtained. One of these is a gastropod—a *Lophospira* which bears a considerable resemblance to *L. conoidea*, Ulrich, but is more depressed and has a much larger apical angle, &c. I venture to suggest the name *Lophospira Billingsensis*, for this species awaiting an opportunity of illustrating it and describing the same in a more complete form.

Normal School Collection of Local Fossils.—In order to stimulate local research in Palæontology and in a small measure to assist the educational world around us, the writer has undertaken to arrange and classify a number of the more typical and easily recognised fossils from the different geological horizons in the Ottawa Valley. These were presented to the Principal of the Normal School, and now occupy a portion of the flat show cases of the physics laboratory. The collection consists of about 150 specimens, which serve to illustrate nearly all the Palæozoic formations comprised in the Ottawa Valley. They include the following formations :

VIII. Niagara.
VII. Lorraine.
VI. Utica.
V. Trenton.
IV. Bird's-eye and Black River.
III. Chazy.
II. Calciferous.
I. Potsdam.

From the above list it will be seen that the red shales and marls of the Medina which occur to the east of Ottawa City, in the County of Russell, and which have been recently visited by the writer, are not included, inasmuch as no fossil organic remains have as yet been obtained from them.

The specimens are all labelled and named. The labels indicate the genera and species, together with the name of the author, as is customary, the geological formation, the precise locality from which they were obtained, besides the name of the collector and the date when they were obtained. A type-written list of the species included in this collection has been placed on the wall alongside the case. Any additions that may be made to this collection by members of the Club will be incorporated in this nucleus of a collection of the fossil remains of Ottawa and vicinity. It is earnestly hoped that members of the Geological section and others will contribute and co-operate in making the series as complete as possible. I would venture to suggest that this collection bear the name "Billings" collection of fossils," not only to do honour to one of Ottawa's greatest men in the list of the departed from this sphere of activity but in order to strive to associate with it the name of a true lover of Nature, and especially of fossil organic remains.

Graptolites.—From 1879 to 1888, whilst engaged in studying the fauna of the Utica about Ottawa, as leader in the Geological branch of our Club, the writer obtained not a few specimens of graptolites in the bituminous shales of this formation. Some of these, especially the *Leptograptidæ* and a number of *Climacograpti*, were in an excellent state of preservation and have since been forwarded to Prof. Chas. Lapworth, of Mason Science College, by the authorities of the Geological Survey department at Ottawa, to whom they had been presented by the writer.

Prof. Lapworth has kindly undertaken to examine the same, and his report is now in the hands of the department. We hope to see the result of his examination of the species of Ottawa Graptolites published at no distant date.

Crinoidea, or Sea-Lilies.—From a communication recently received from Prof. F. A. Bather, of the British Museum, he informs the writer that he has almost completed his investigations and studies of the collection of Ottawa *Crinoidea* and *Cystoidea* sent by the writer some years ago to the authorities of the British Museum. This collection formed part of the Stewart collection, of which such fine and unusually well-preserved forms were purchased by the Geological Survey department and are now placed on exhibition in one of the Trenton cases in the Palæontological Section. Prof. Bather's notes on these Ottawa species will be looked forward to with much interest. As was pointed out some years ago by Mr. Walter R. Billings, the members of the Geological branch of the Club can do much in helping to further the interests of science and scientific research in our midst by communicating their specimens to specialists.

Pleistocene Geology.—In connection with the work of investigating the boulder-clay, marine sediments, such as the Leda clay and overlying Saxicava sands in the series of Pleistocene deposits, considerable progress has been made. Probably as an inducement to make additional collections and investigations in the marine clays of the Ottawa Valley, one of your leaders has been selected to represent this portion of Canada on the Committee of the British Association for the Advancement of Science "to investigate the fauna and flora of the Pleistocene of Canada, of which Sir Wm. Dawson is Chairman."

Bibliography.—The progress of Geological work in Canada during 1898, as recorded by the writer,* shows that upwards of seventy distinct reports, publications or pamphlets were published during the past year by Canadian geologists either in Canada, Great Britain or the United States.

It is earnestly hoped that during the coming season much work will be accomplished in this district.

All of which is respectfully submitted.

(Sgd.) H. M. AMI.
Leader.

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BELLINURUS GRANDÆVUS, A NEW SPECIES OF PALÆOZOIC LIMULOID CRUSTACEAN RECENTLY DESCRIBED BY PROF. T. R. JONES AND DR. HENRY WOODWARD, FROM THE EO-CARBONIFEROUS OF RIVERSDALE, NOVA SCOTIA.

BY H. M. AMI, M.A., F.G.S.

In 1897, while carrying on a palæontological survey of various geological horizons in Nova Scotia with a view of ascertaining the taxonomic relations of the various zones in the formations characterizing the Carboniferous system of that province, I was fortunate enough to find "two tiny specimens of Palæozoic Limuloid Crustaceans." With Dr. G. M. Dawson's permission, these were forwarded to Dr. Henry Woodward, Keeper of the British Museum, South Kensington, the eminent authority on Crustacea, and in a paper recently published* by him conjointly with my friend Prof. T. Rupert Jones, F.R.S., &c., the specimens are described under the name *Bellinurus grandævus*, Jones & Woodward.

This crustacean was obtained from the Riversdale formation, in the greenish grey and rusty shales of the sixth cutting east of Riversdale, Colchester County, Nova Scotia, along the Intercolonial Railway of Canada. This is the third cutting east of Calvary Brook, which discharges its waters into the Black River branch of the Salmon River. The geological position of this new form is best indicated by the following note on the order of superposition of the strata in the neighbourhood of Riversdale station, in descending order as observed by the writer and as has been clearly pointed out by Mr. Hugh Fletcher, B.A., of the Geological Survey of Canada in various reports :**

1. *Windsor formation*, with marine limestones with gypsum and marls holding abundance of iron pyrites.

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*"Contributions to Fossil Crustacea," by Professor T. Rupert Jones, F.R.S., F.G.S., and Henry Woodward, LL.D., F.R.S., F.G.S., Geol. Mag., Dec. IV, Vol. VI, No. 423, p. 388, September, 1899. Plate XV, figs. 2 and 3.

** See Ann. Rep. Geol. & Nat. His. Surv., Can. Vol. II, p. 64P, Montreal, 1887.

2. Unconformity.
3. *Union formation*, consisting for the most part of red shales and sandstones, &c., as seen in the excellent rock-cuttings along the I. C. R., near Union Station, eight miles below Riversdale.
4. *Riversdale formation*, marked by black carbonaceous, dark grey and red, greenish-grey and rusty shales and grey sandstones with a few calcareous layers as seen in the numerous cuttings along the I. C. R. east of Riversdale station and in the valleys of the Calvary Brook and Black River.

Considerable discussion has arisen of late as to whether the rocks of the *Union* and *Riversdale* formations belong to the Carboniferous or Devonian systems. After describing the two specimens obtained by the writer, Prof. Jones and Dr. Woodward make the following statement regarding the horizon at which the genus *Bellinurus* usually occurs :

"Although *Bellinurus* is a very ancient type of *Limulus*, it has not at present been found in rocks of earlier age than the Coal-measures, nor can we assert that the black, grey and glossy shales of Riversdale, Colchester County, Nova Scotia, in which these specimens occur, are older than Carboniferous."

Several interesting examples of a species of *Leaia* were found associated with *Bellinurus grandævus* in the black shales of the fifth cutting east of Riversdale station which, after examination, Prof. T. R. Jones refers to his *Leaia Leidyi*. The authors add :

"*Leaia Leidyi*, T. R. Jones, which occurs with *Bellinurus* in these Riversdale black shales, occurs in the Lower Carboniferous of Pennsylvania, but in rocks 'regarded by some geologists as the uppermost part of the Devonian or Old Red Sandstone.'* *Leaia* also occurs in the Upper Coal Measures of Lancashire and the Lower Carboniferous of Fifeshire. As the two specimens of *Bellinurus* (Pl. XV, figs. 2 and 3) are both imperfect, and better materials may at any time be forthcoming, it seems prudent to refrain from suggesting more than one trivial name. This Crustacean may therefore be known as *Bellinurus grandævus*, Jones

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*"Fossil Estheriæ," Pal. Soc. Monogr. p. 117, pl. V, figs. 11 and 12. London, 1862.

& Woodw., Lower Carboniferous series, Riversdale, Colchester Co., Nova Scotia."

NOTE.—Several interesting specimens of a small decapod crustacean allied to *Anthracopalæmon*, Salter, are seen to occur in the more recent collections of fossil organic remains obtained by the writer from the shaly strata of the Riversdale formation on the Harrington River, which forms the boundary between Cumberland and Colchester Counties, in Nova Scotia. All the congeners of this species so far described in North America occur in the Coal Measures, and are therefore distinctly Carboniferous. This affords additional evidence in support of the view that the Riversdale formation is *Carboniferous*.—H.M.A.